

Amendment to 10/614,258 dated 28 July 2004

Page 2 of 9

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Previously Presented) A method for underground drilling, the method comprising:
 - a) generating high intensity reduced pressure pulses at the surface of an area to be drilled;
 - b) coupling the high intensity reduced pressure pulses into drilling mud being pumped into a drill string;
 - c) allowing the high intensity reduced pressure pulses to propagate down the drill string to an underground location; and,
 - d) allowing the high intensity reduced pressure pulses to do work at the underground location.
2. (Original) The method of claim 1 wherein the work comprises causing a flow of drilling fluid through nozzles in a drill bit at the bottom of the drill string to fluctuate.
3. (Original) The method of claim 1 wherein the work comprises operating a down hole tool.
4. (Original) The method of claim 3 wherein operating the downhole tool comprises forcing a portion of the drill string which includes the drill bit suddenly downwardly.
5. (Previously Presented) The method of claim 4 wherein generating the high intensity reduced pressure pulses comprises causing drilling mud to

Amendment to 10/614,258 dated 28 July 2004

Page 3 of 9

flow in a conduit and suddenly and periodically interrupting the flow of drilling mud in the conduit.

6. (Previously Presented) A method for underground drilling, the method comprising:
 - a) generating high intensity pressure pulses at the surface of an area to be drilled;
 - b) coupling the high intensity pressure pulses into drilling mud being pumped into a drill string;
 - c) allowing the high intensity pressure pulses to propagate down the drill string to an underground location; and,
 - d) allowing the high intensity pressure pulses to operate a downhole tool at the underground location,wherein operating the downhole tool comprises lifting a portion of the drill string which includes the drill bit upwardly and compressing a spring.
7. (Original) The method of claim 6 wherein generating the high intensity pressure pulses comprises causing drilling mud to flow in a conduit and suddenly and periodically interrupting the flow of drilling mud in the conduit.
8. (Previously Presented) The method of claim 1 wherein generating the high intensity reduced pressure pulses comprises causing drilling mud to flow in a conduit and suddenly and periodically interrupting the flow of drilling mud in the conduit.

Amendment to 10/614,258 dated 28 July 2004

Page 4 of 9

9. (Original) The method of claim 8 wherein causing drilling mud to flow in a conduit comprises diverting a portion of a main flow of drilling mud from a mud pump to the drill string into the conduit.
10. (Original) The method of claim 9 comprising returning mud which has flowed through the conduit to a mud tank.
11. (Previously Presented) The method of claim 7 wherein causing drilling mud to flow in a conduit comprises diverting a portion of a main flow of drilling mud from a mud pump to the drill string into the conduit, the method comprising providing a point at which a hydrostatic pressure of drilling mud flowing toward a drill string in a main conduit is reduced and introducing mud which has flowed through the conduit into the main conduit at the point of reduced pressure.
12. (Original) The method of claim 11 wherein providing a point at which a hydrostatic pressure of drilling mud flowing toward a drill string in a main conduit is reduced comprises providing a jet pump and causing drilling mud flowing in the main conduit to pass through the jet pump.
13. (Previously Presented) The method of claim 1 practised on a drilling rig having a drill string suspended from a swivel and a flexible hose carrying drilling mud into the swivel for passage down the drill string wherein coupling the high intensity reduced pressure pulses into drilling mud being pumped into the drill string comprises

Amendment to 10/614,258 dated 28 July 2004

Page 5 of 9

coupling the high intensity reduced pressure pulses into drilling mud upstream from the flexible hose.

14. (Previously Presented) The method of claim 4 practised on a drilling rig having a drill string suspended from a swivel and a flexible hose carrying drilling mud into the swivel for passage down the drill string wherein coupling the high intensity reduced pressure pulses into drilling mud being pumped into the drill string comprises coupling the high intensity reduced pressure pulses into drilling mud upstream from the flexible hose.
15. (Currently Amended) The method of claim 6 practised on a drilling rig having a drill string suspended from a swivel and a flexible hose carrying drilling mud into the swivel for passage down the drill string wherein coupling the high intensity pressure pulses into drilling mud being pumped into the drill string comprises coupling the high intensity ~~reduced~~ pressure pulses into drilling mud upstream from the flexible hose.
16. (Previously Presented) The method of claim 1 practised on a drilling rig having a drill string suspended from a swivel and a flexible hose carrying drilling mud into the swivel for passage down the drill string wherein coupling the high intensity reduced pressure pulses into drilling mud being pumped into the drill string comprises coupling the high intensity reduced pressure pulses into drilling mud downstream from the swivel.

Amendment to 10/614,258 dated 28 July 2004

Page 6 of 9

17. (Previously Presented) The method of claim 4 practised on a drilling rig having a drill string suspended from a swivel and a flexible hose carrying drilling mud into the swivel for passage down the drill string wherein coupling the high intensity reduced pressure pulses into drilling mud being pumped into the drill string comprises coupling the high intensity reduced pressure pulses into drilling mud downstream from the swivel.
18. (Currently Amended) The method of claim 6 practised on a drilling rig having a drill string suspended from a swivel and a flexible hose carrying drilling mud into the swivel for passage down the drill string wherein coupling the high intensity pressure pulses into drilling mud being pumped into the drill string comprises coupling the high intensity reduced pressure pulses into drilling mud downstream from the swivel.
19. (Previously Presented) Underground drilling apparatus comprising:
- a) a drill string;
 - b) a mud pump;
 - c) a main conduit carrying mud pumped by the mud pump toward the drill string;
 - d) pulse generator means located at the surface for generating high intensity reduced pressure pulses;
 - e) pulse transmission means for coupling high intensity reduced pressure pulses generated by the pulse generator means into mud being pumped toward the drill string.

Amendment to 10/614,258 dated 28 July 2004

Page 7 of 9

20. (Previously Presented) A method for underground drilling, the method comprising:
- generating high intensity pressure pulses at the surface of an area to be drilled;
 - coupling the high intensity pressure pulses into drilling mud being pumped into a drill string;
 - allowing the high intensity pressure pulses to propagate down the drill string to an underground location; and,
 - allowing the high intensity pressure pulses to operate a downhole tool at the underground location,
- wherein operating the downhole tool comprises moving a portion of the drill string below the downhole tool which includes the drill bit relative to a portion of the drill string above the downhole tool.
21. (Previously Presented) The method of claim 20 wherein moving a portion of the drill string below the downhole tool which includes the drill bit relative to a portion of the drill string above the downhole tool comprises lifting the portion of the drill string below the downhole tool which includes the drill bit.
22. (New) The method of claim 3 wherein operating the downhole tool comprises lifting a portion of the drill string which includes the drill bit upwardly and compressing a spring.
23. (New) The apparatus of claim 19 wherein the drill string comprises a downhole tool.

Amendment to 10/614,258 dated 28 July 2004

Page 8 of 9

24. (New) The apparatus of claim 23 wherein the downhole tool comprises one or more pistons.
25. (New) The apparatus of claim 23 wherein the downhole tool is a drilling jar.